

Characterization of African Soils and Site Evaluation

Work Plan 7, Africa Study C

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Introduction

On-site CRSP research in Rwanda ended in April, 1994 as a result of war and civil violence following the deaths of the presidents of Rwanda and Burundi. Continued lack of security has prompted the relocation of research to the U.S. along with initiation of a search for a replacement African site. Objectives of this study included the development of site selection criteria, collection of data and evaluation of promising sites, and characterization of African soils. Site evaluation continues in the Interim Work Plan, Study 1, a cooperative work plan with the Africa/Auburn PD/A CRSP.

Materials and Methods

Fifteen site evaluation criteria for prime and companion sites were developed with input from the Technical Committee and ME. USAID requirements for new CRSP sites were attached. Information on potential sites was solicited from the CRSP and gathered from other sources. AID planning documents for all Sub-Saharan African countries were examined to determine current AID program status and strategic objectives. Promising countries and sites were identified and requests to travel to the two most promising sites initiated. Soils were collected from two African sites using a 5-cm core forced 15 cm into the substrate. At least three cores were taken from four locations at two sites. Soils were characterized for CEC, sand, silt and clay content, pH, lime requirement, exchangeable bases, and base saturation.

Results

Promising sites were identified at Sagana, Kenya; Malawi (Bunda College station and Domasi Experimental Fish Farm) and several sites in Zimbabwe. Travel approval was requested for Malawi and Kenya, the most promising sites. Travel to Malawi was not approved by AID Malawi; the trip to Kenya was completed November, 1994 by Seim and Egna. Sagana Fish Culture Farm, about 100 km northeast of Nairobi was found to have the potential to meet most selection criteria for a new site, but support from the Kenya Department of Fisheries was not encouraging. A Kenya policy of one international project per site made location there uncertain in light of the current Belgian studies at Sagana. [New leadership in the Dept. of Fisheries is now supportive of CRSP presence at Sagana. Deputy Director (and acting Director) of Fisheries Oduor would be supportive of a direct agreement with the CRSP should that site be selected]. Information on other potential sites in Africa was also received.

Five composite soil samples were brought back from Kenya in November, 1994. Four of the composite samples came from the Sagana Farm and one from the Baobab Farm near Mombasa. Of the five, three proved to be quite alkaline and two quite acid. All samples from Kenya had very high clay contents (49.7 - 81.7%). Sagana soil samples were low in pH for a pond not recently in use and near neutrality for ponds more recently in use. Previously collected Rwandan soils were combined to form six composite samples (Table 1). All samples from Rwanda were very acid (pH 3.9-5.6), and base saturation levels were generally low. One of the Rwandan composite soils was very high in organic matter (OM); this high OM level was reflected in the CEC of this soil (62.6 meq/100g), and, in the extremely high lime requirement estimates obtained by all methods used.

Discussion

Further investigation of Sagana appeared warranted. That station is quite large, and some 40 ponds with a total water area of about 15 ha now exist, with additional land area and water capacity in reserve. There are no restrictions on use of fish species of interest but the capacity to conduct CRSP chemical analyses is limited and would have to be expanded. The Africa project lost essentially all its equipment and supplies, destroyed or left behind in Rwanda. Much of this would have to be replaced before a new site would be operational. This would be especially true for Sagana Station which currently has limited analytical capacity. Malawi is still considered of interest because of a strong desire by Malawians at Bunda College for collaboration, and the importance of aquaculture in Malawi. The presence of ALCOM (Aquaculture for Local Community Development of FAO) in Malawi gives it potential as a regional center for aquaculture. Restrictions on the use of *Oreochromis niloticus*, however, may allow only companion site consideration for Malawi. Regardless, links with ALCOM and Malawian aquaculturists would broaden networking and information exchange from any African site. Zimbabwe, Zambia and Tanzania remained under consideration.

Strategic Objectives as published were found less informative than Mission interpretation and application. "Food Security" for instance, would not necessarily include aquaculture as being within the Mission objectives. Site evaluation and development planning continue under the Interim Work Plan, Study 1.

Anticipated Benefits

The selected site will be chosen both for local and regional impact in Africa. Countries south of Kenya are organized within SADC (Southern African Development Community). Ties with SADC will be sought regardless of the prime site location to extend the regional impact of the CRSP activities in Africa. An apparent need in Africa is the development of efficient and sustainable strategies for pond aquaculture, and the training of individuals to extend this information to the farmers. CRSP objectives under the new proposal would contribute to meeting this need. Planning to emphasize regional impact takes advantage of existing networks and encourages the development of links between aquaculture scientists working in Africa to expand impacts.